Loris Bazzani

Principal Applied Scientist in AI at Amazon and Musician

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Motivation

With a proven track record of scientific publications and transferring science into products, I am excited to take opportunities that push the boundaries of what's possible, break the norms and help growing my technical, leadership and personal skills. Throughout my career, I have been deeply passionate about pushing the boundaries of AI, particularly in the realm of multimodal generative AI, that connect images/videos, language and different types of user interactions (e.g., LMMs RAGs and stable diffusion). My experience in researching new problems and developing large-scale machine learning and computer vision solutions has equipped me with a unique perspective on leveraging AI to create cutting-edge technology and ensuring that it meets both technical standards and business objectives. One of my key strengths lies in my ability to navigate between scientific breath and depth, allowing me to effectively reason and contribute to a wide range of scientific work while also diving deep into technical details when necessary. These skills has been instrumental in designing and prototyping complex AI models, articulating their practical value to leadership teams and delivering to production in collaboration with several scientists, engineers, and product managers across different organizations at global level.

Experience

Amazon - Principal Applied Scientist - AI 2022-now

- Led the science strategy and research roadmap for multimodal AI across Amazon's consumer platforms, focusing on vision-language models (VLMs), large multimodal models (LMMs), generative modeling, and scalable training/inference.
- Drove end-to-end development of novel architectures for multimodal retrieval, similarity learning, and content diversification, while shipping new recommendation features for Fashion and Home on Amazon.com and Alexa, reaching millions of users and generating O(XXM) USD in incremental revenue.
- Advanced the state of the art through publications at CVPR, ICCV, and ECCV and multiple patent filings, extending retrieval-based generation, vision-language alignment, and multimodal representation learning.
- Scaled and mentored a centralized science organization from 4 to 15 scientists; coordinated daily with engineering and product leaders across Alexa, Prime Video, and Fashion to set research goals, review model designs, and grow talent.
- Regularly presented strategic updates to VP- and SVP-level leadership, influencing technical direction and investment decisions across multiple organizations.

Amazon - Senior Applied Scientist – AI/Computer Vision 2018-2022

- Drove core research in video understanding and vision-language alignment, delivering large-scale models adopted by Prime Video, Amazon Retail, and Search for action recognition and content comprehension.
- Spearheaded the research and prototyping of "Rapid Recap", an action-recognition system for live football broadcasts on Prime Video, allowing users to instantly catch up on key plays during streaming.
- Led foundational research on image accessibility, studying model-based generation of alternative text for millions of catalog images. The work influenced senior leadership decisions and guided Amazon's future accessibility initiatives.
- Led interdisciplinary pods of applied scientists, software engineers, and PMs; mentored junior scientists to promotion and supervised multiple research interns.

Amazon - Applied Scientist – AI/Computer Vision 2016-2018

- Pioneered Amazon's first deep learning models for video understanding, launching the company's initial research efforts in this domain.
- Led the team's inaugural video project, which laid the foundation for centralized video AI efforts within Prime Video, later scaled into a broader science team following the success of this work.

- Designed and implemented production-grade deep learning pipelines for automated maturity classification and duplicate video detection, significantly reducing manual audit time and improving compliance workflows across Prime Video.
- Co-authored foundational patents and internal papers, contributing to Amazon's IP portfolio in large-scale video analysis and compliance automation.
- Worked closely with engineering teams to integrate experimental models into production systems, delivering the first successful AI-powered video features in Prime Video.
- Built reproducible research workflows, including training/inference infrastructure, dataset curation, and evaluation tools, that became standard across other science teams.

Dartmouth College - Postdoc Researcher - Visual Learning Group 2014–2015

- Research on deep learning and computer vision, with production of joint publications and collaboration with industrial entities and international universities, on object recognition and video understanding; and basic teaching activities.

VIBE - Co-founder 2012–2014

- Co-founded a spin-off during my time at the Italian Institute of Technology. VIBE offered technology capable of automatically generating accurate quantitative information about consumer behavior when faced with a physical advertisement. VIBE implemented computer vision and machine learning algorithms that, while strictly respecting privacy, enable the automatic analysis of different consumer categories, their movements, and their reactions.

Italian Institute of Technology - Postdoc Researcher - PAVIS Dept. 2012–2013

- Led research on computer vision and machine learning, participating in industrial projects, with a focus on social interaction analysis, person re-identification and object recognition using dynamic Bayesian nets and Bayesian non-parametric models, and kernel-based methods.

University of British Columbia - Visiting Scholar - Laboratory for Computational Intelligence 2010

- Explored deep generative neural models, including restricted Boltzmann machines, attentional models, and sequential Monte Carlo methods, laying foundational knowledge that informed later work in deep learning and generative AI.

Education

University of Verona - Ph.D. in Computer Science Computer 2009–2012

- PhD Thesis: Beyond multi-target tracking: statistical pattern analysis of people and groups
- Supervisors: V. Murino and M. Cristani. Reviewers: A. Del Bimbo and R. T. Collins

University of Verona - M.S. in Intelligent and Multimedia Systems 2006–2008

Thesis topics: particle filtering and multi-person tracking. Summa cum laude and top of the class

University of Verona - B.S. in Information Technology 2003–2006

Thesis topics: machine learning for medical imaging

Research, Publications & Patents

- Z. Wang, S. Ramasinghe, C. Xu, J. Monteil, L. Bazzani, T. Ajanthan. Learning Visual Hierarchies in Hyperbolic Space for Image Retrieval, ICCV 2025.
- M. Guillaumin, M. Jaritz, S. Sternig, L. Bazzani. UniCoRN: Unified Commented Retrieval Network with LMMs, Arxiv 2025.
- V. Pippi, M. Guillaumin, S. Casciarelli, R. Cucchiara, M. Jaritz, L. Bazzani. ToFu: Visual Tokens Reduction via Fusion for Multi-modal, Multi-patch, Multi-image Task, Arxiv 2025.
- A. Cao, M. Jaritz, M. Guillaumin, R. de Charette, L. Bazzani. LatteCLIP: Unsupervised CLIP Fine-Tuning via LMM-Synthetic Texts, WACV 2025.
- X. Yang, Y. Zuo, S. Ramasinghe, L. Bazzani, G. Avraham, A. van den Hengel. ViewFusion: Towards Multi-View Consistency via Interpolated Denoising, CVPR 2024.
- R. Bodur, E. Gundogdu, B. Bhattarai, T-K Kim, M. Donoser, L. Bazzani. iEdit: Localised Text-guided Image Editing with Weak Supervision, In CVPR Workshops, 2024.

- US Patent 11,720,942: Interactive retrieval using visual semantic matching, 2023.
- US Patent 11,809,520: Localized visual similarity, 2023.
- US Patent 11,829,445: Attribute-based interactive product recommendations, 2023.
- M. Xu, E. Gundogdu, M. Lapin, B. Ghanem, M. Donoser, L. Bazzani. Contrastive Language-Action Pre-training for Temporal Localization, Arxiv, 2022.
- US Patent 11,416,910: Visual blending of content, 2022.
- US Patent 11,361,212: Machine learning system to score alt-text in image data, 2022.
- Y. Hou, E. Vig, M. Donoser, L. Bazzani. Learning Attribute-driven Disentangled Representations for Interactive Fashion Retrieval, ICCV, 2021.
- A. Salvador, E. Gundogdu, L. Bazzani, M. Donoser. Revamping Cross-Modal Recipe Retrieval with Hierarchical Transformers and Self-supervised Learning, CVPR, 2021.
- A. D'Innocente, N. Garg, Y. Zhang, L. Bazzani, M. Donoser. Localized Triplet Loss for Fine-Grained Fashion Image Retrieval. CVPR Workshops, 2021.
- Y. Chen, and L. Bazzani. Learning Joint Visual Semantic Matching Embeddings for Language-guided Retrieval, ECCV, 2020.
- Y. Chen, S. Gong, and L. Bazzani. Image Search with Text Feedback by Visiolinguistic Attention Learning, CVPR, 2020.
- US Patent 10,643,074: Automated video ratings, 2020.
- L. Bazzani, T. Domhan, and F. Hieber. Image Captioning as Neural Machine Translation Task in SOCKEYE, Arxiv, 2018.
- S. Vascon, and L. Bazzani, Group Detection and Tracking using Sociological Features, In Group and Crowd Behavior for Computer Vision, 2017.
- V. Murino, S. Gong, C. C. Loy and L. Bazzani, Image and Video Understanding in Big Data, Special Issue in CVIU, 2017.
- S. Vascon, and L. Bazzani, Group Detection and Tracking using Sociological Features, In Group and Crowd Behavior for Computer Vision, 2017.
- M. San Biagio, H. Q. Minh, L. Bazzani, V. Murino. Approximate Log-Hilbert-Schmidt distances between covariance operators for image classification, CVPR, 2016.
- L. Bazzani, A. Bergamo, D. Anguelov, L. Torresani. Self-taught object localization with deep networks, WACV, 2016.
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework in vector-valued reproducing kernel Hilbert spaces for manifold regularization and co-regularized multi-view learning, JMLR, 2016.
- H. Q. Minh, M. San Biagio, L. Bazzani, and V. Murino, Kernel Methods on Approximate Infinite-Dimensional Covariance Operators for Image Classification, Arxiv, 2016.
- L. Bazzani, M. Zanotto, M. Cristani, V. Murino, Joint individual-group modeling for tracking, PAMI, 2015.
- L. Bazzani, M. Cristani, and V. Murino. SDALF: Modeling human appearance with symmetry-driven accumulation of local features, Person Re-identification, 2014.
- M. San Biagio, L. Bazzani, M. Cristani, V. Murino, Weighted bag of visual words for object recognition, ICIP, 2014.
- H. Q. Minh, L. Bazzani, V. Murino, A unifying framework for vector-valued manifold regularization and multi-view learning, ICML, 2013.
- D. Figueira, L. Bazzani, H.Q. Minh, M. Cristani, A. Bernardino, and V. Murino, Semi-supervised multi-feature learning for person re-identification, AVSS, 2013.
- P. Salvagnini, L. Bazzani, M. Cristani, and V. Murino, Person re-identification with a PTZ camera: an introductory study, ICIP, 2013.
- L. Bazzani, M. Cristani, and V. Murino. Symmetry-driven accumulation of local features for human characterization and re-identification, CVIU, 2013.
- L. Bazzani, D. Tosato, M. Cristani, M. Farenzena, G. Paggetti, G. Menegaz, V. Murino, Social interactions by visual focus of attention in a three-dimensional environment, Expert Systems, 2013.

- L. Bazzani, V. Murino, and M. Cristani, Decentralized particle filter for joint individual-group tracking, CVPR, 2012.
- M. Zanotto, L. Bazzani, M. Cristani, and V. Murino, Online bayesian non-parametrics for social group detection, BMVC, 2012.
- L. Bazzani, M. Cristani, G. Pagetti, D. Tosato, G. Menegaz, V. Murino, Analyzing groups: a social signaling perspective, Video Analytics for Business Intelligence, 2012.
- B. I. Barbosa, M. Cristani, A. Del Bue, L. Bazzani, and V. Murino, Re-identification with RGB-D sensors, In 1st International Workshop on Re-Identification, 2012.
- L. Bazzani, M. Cristani, A. Perina, V. Murino, Multiple-shot person re-identification by chromatic and epitomic analyses, PRL, 2012.
- M. Denil, L. Bazzani, H. Larochelle, and N. de Freitas, Learning where to attend with deep architectures for image tracking, Neural Computation, 2012.
- L. Bazzani, N. de Freitas, H. Larochelle, V. Murino, J. Ting, Learning attentional policies for object tracking and recognition in video with deep networks, ICML, 2011.
- D. S. Cheng, M. Cristani, M. Stoppa, L. Bazzani, V. Murino, Custom pictorial structures for re-identification, BMVC, 2011.
- M. Cristani, L. Bazzani, G. Paggetti, A. Fossati, A. Del Bue, D. Tosato, G. Menegaz, V. Murino, Social interaction discovery by statistical analysis of F-formations, BMVC, 2011.
- M. Cristani, G. Paggetti, A. Vinciarelli, L. Bazzani, G. Menegaz, V. Murino, Towards computational proxemics: Inferring social relations from interpersonal distances, SocialCom, 2011.
- L. Bazzani, M. Cristani, A. Perina, M. Farenzena, and V. Murino, Multiple-shot person re-identification by HPE signature, ICPR, 2010.
- M. Farenzena, L. Bazzani, A. Perina, V. Murino, and M. Cristani Person re-identification by symmetry-driven accumulation of local features, CVPR, 2010.
- L. Bazzani, N. de Freitas, J. Ting, Learning attentional mechanisms for simultaneous object tracking and recognition with deep networks, Workshop on Deep Learning and Unsupervised Feature Learning, 2010.
- L. Bazzani, M. Cristani, and V. Murino, Collaborative particles filters for group tracking, ICIP, 2010.

Blue color = top-tier computer vision/machine learning conferences or journals.

Coding & Tools

- Python, PyTorch, HuggingFace, git, LATeX, bash scripting, LLM prompting, various AWS services
- Passionate about and participated to several internal Hackathons (at least 1 per year)
- In past, I worked with MATLAB, Lua/Torch7, JavaScript, Qualtrics, Alexa skill devel tools

Awards & Grants

- **Outstanding Reviewers @ CVPR**, recognition that reflects not only the quality and depth of reviews but also your commitment to fairness, clarity, and timely feedback, 2025.
- **Amazon Accessibility Innovation Award**, internal award given to individuals who created experiences to improve accessibility, 2021.
- **Amazon Robotics Challenge Award**, internal award given to the team who won the robotics challenge, 2018.
- **Finalist at SmartCup Liguria 2013 with VIBE**, 5 startups were selected at the regional level to enter this stage where they were presented to a panel of expert judges, 2013.
- **IBM Best Student Paper Award**, track: Computer Vision at International Conference on Patter Recognition ICPR, 2010.
- **Scholarship** from University of Verona that supported my Ph.D. from Jan. 2009 to Dec. 2011.
- **Scholarship** from EU-Project FP7 SAMURAI, grant FP7-SEC-2007-01 No. 217899, that contributed to support my Ph.D. from Jan. 2009 to Dec. 2011.
- **Travel grant** from University of British Columbia to attend Neural Information Processing Systems, 2010.

- **Travel grant** from International Machine Learning Society to attend the International Conference on Machine Learning, 2011.

AI Community Efforts

- Co-organizer of the workshop on Computer Vision for Fashion, Art, and Design @ CVPR/ICCV
- Co-organizer of the workshop on 3D Vision and Modeling Challenges in eCommerce @ ICCV/ECCV
- Co-organizer and program chair of 8 AI conferences and shopping science summits internal at Amazon
- Active reviewer for CVPR, ICCV, ECCV, NeurIPS, ICML, ICLR, IEEE TPAMI, IJCV, IEEE Transactions on Multimedia, IEEE Transactions on Image Processing

Teaching & Presentations

Presentations
Delivered 50+ technical presentations at AI conferences and internal Amazon events to audiences of up to 1000 people

Dartmouth College Winter 2015
Machine Learning. Assistant of undergrad course by L. Torresani

Italian Institute of Technology Winter 2013
An Introduction to Machine Learning and Computer Vision for PhD students

University of Modena and Reggio Emilia Spring 2011
Person Re-identification at the Short Spring School in Surveillance for PhD students

My Mentors

I was fortunate enough to work with and learn from my awesome mentors during my career so far. Their advice and feedback helped me growing in a way I could never imagine. Thank you all!

- Prof. Anton van den Hengel, Prof. Larry Davis, Dr. Raffay Hamid, Dr. Josh Miele, Dr. Werner Trobin: science and technical guidance at Amazon
- Dr. Michael Donoser and Dr. Rajiv Chopra: leadership and management guidance at Amazon
- Prof. Lorenzo Torresani and Prof. Hugo Larochelle: research leadership at Dartmouth College
- Prof. Vittorio Murino and Prof. Marco Cristani: research leadership at University of Verona and at the Italian Institute of Technology
- Prof. Nando de Freitas: research leadership at the University of British Columbia

What Else About Me

You might want to know other traits of me, not just my technical skills and achievements, right? Here are some:

- Growth mindset and value learning new skills, expanding my knowledge and improving different abilities in all aspects of my life
- Cultivate cross-cultural communication skills through living and working in diverse environments
- Nurture my creative side as musician, playing keyboards and piano since a young age. I played in several local bands and have one now. I'm currently learning guitar and music production
- Invest on taking care of the mind, emotions and my mental health via meditation, introspection and other tools
- High level of self-awareness. I'm keen to admin my mistakes when others or I recognize them, and learn from them
- My favourite books I've recently read: the power of vulnerability by B. Brown; the myth of normal by G. Matè and D. Matè; the five invitations by F. Ostaseski
- My big 5: openness 90, conscientiousness 88, extraversion 40, agreeableness 46 and neuroticism 29
- Fluently speak Italian, English and Venetian (yes, it's a launguage and quite different from Italian). I'm slowly learning German too

What colleagues say about me:

- "You cultivate an exceptional research culture where creativity and science can thrive. Through your guidance, teams uncover innovative paths forward by exploring new directions and questioning norms."
- "He is a top tier scientist that can handle large technical complexity. His scientific depth, breath and technical skills are top notch."
- "One of his super powers is to give honest and constructive feedback, without compromising for social cohesion. He voices concerns when a minority of the group might also be impacted."
- "He is that rare combination between a big thinker and someone who's in touch with the technical details."

Some of the growth areas I'm focusing on: foster more autonomy in others and improve my strategical leadership.